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| 10/051,460 | 01/22/2002 | John Fox | 09850-013001 | 2845 |

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EXAMINER

SAYOC, EMMANUEL

ART UNIT PAPER NUMBER

3746

DATE MAILED: 07/25/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,460

Applicant(s)

FOX ET AL.

Examiner

Emmanuel Sayoc

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31,33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) 32 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16,19-22 and 28 is/are allowed.
- 6) ☒ Claim(s) 1,6-10,15,17,18,23,24,26,27,29-31,33 and 34 is/are rejected.
- 7) ☒ Claim(s) 2-5,11-14 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 December 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11, 13.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This office action is in response to the amendments of 6/11/2003. In making the below rejections and/or objections the examiner has considered and addressed each of the applicants arguments.

Election/Restrictions

2. Newly submitted claim 32 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the method does not require the particulars of the apparatus claimed. For example, a device that does not contain an actuating mechanism centered in between a plurality of pistons can carry out the method. In addition the apparatus as claimed can be used to carry out fluid compression, as discussed in this office action, and in contrast to a fluid mixing process as claimed in the method of claim 32.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 32 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Examiner recommends that the title capture some structure of the claimed invention such as the actuating mechanism, the adjustable piston strokes, the axially movable flywheel, or the variant piston cylinder volumes and strokes.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 6-8, 10, 15, 27, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Goto et al. (US 5,931,645).

With respect to claim 1, in Figure 1, Goto et al. discloses an axial piston pump comprising a swash plate actuating mechanism (25), and a plurality of non-rotating piston cylinders (29, 30) arranged radially about the actuating mechanism (25), and coupled to the actuating mechanism (25). The first cylinder (7) has a working volume that differs from the working volume of the second cylinder (8). Figure 3 illustrates the two different cylinder bore diameters with the first diameter, corresponding to a set of low-pressure cylinders, and the second diameter corresponding to a set of high-pressure cylinders. Since a single swash-plate actuates the cylinders, it is inherent that the strokes are uniform throughout all the pistons. Therefore, given the different cylinder geometry and the uniform stroke, it follows that the working volume of the first cylinder (7) is different from the second cylinder (8). The actuating mechanism (25) is configured to adjust the stroke.

With respect to claims 6 and 7, the first cylinder (8) has an inner diameter, corresponding to the claimed dimension defining an inner volume, that differs from the corresponding inner diameter of the second cylinder (7).

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With respect to claim 8, at least 3 cylinders are shown in Figure 3.

With respect to claim 15, the actuating mechanism (25) is centrally located about a central axis of the pump.

With respect to claim 10, the actuating mechanism, in this case swash plate (25) comprises a radially extending plate, which constitutes a transition arm inducing a top and bottom stroke on the piston. The actuating mechanism is coupled to the shaft, a rotary member, and bearings on both ends of the plate, a stationary member.

With respect to claim 27, the axis of rotation of the swash plate (25) and the longitudinal axis of the pistons are parallel.

With respect to claim 29, since the cylinder bore (7) and the cylinder bore (8) have different diameters, it is inherent that the distance from the center point of the actuating mechanism (25) to the cylinder bores are different.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 9, 23, 24, 26, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goto et al. (mentioned previously).

Goto et al. sets forth a device as described above, which is substantially analogous to the claimed invention. The Goto et al. device differs from the claimed invention in that there is no

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disclosure of each cylinder having a working volume that differs from the other cylinders.

Within the art, it was well known that swash plates contain various numbers of piston cylinders depending on the compression capacity required. Goto et al. discloses two sets of pistons with different cylinder diameters. It would have been obvious to one of ordinary skill in the art at the time the invention was made to reduce the number of cylinders, in a lower compression capacity requirement. With the lower compression capacity variation, it would have been further obvious to maintain ^{the} use of piston(s) with different working volumes, i.e. inner diameters, as taught by Goto et al., in order to achieve different compression stages as required.

The actuating mechanism was identified as swash plate (25). Since the rotary shaft (shown not enumerated) in Figure 1 actuates the swash plate (25), technically, it is the combination of the plate (25) and the drive shaft that actuates the pistons (29, 30). As shown in Figure 1, a portion of the shaft is located between the piston cylinders (7, 8).

With respect to claim 24, the actuating mechanism, in this case swash plate (25) comprises a radially extending plate, which constitutes a transition arm inducing a top and bottom stroke on the piston. The actuating mechanism is coupled to the shaft, a rotary member, and bearings on both ends of the plate, stationary member.

With respect to claim 26, the actuating mechanism is centrally located about the central axis of the compressor.

8. Claims 17, 30, 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forster (U.S. 4,449,444).

In Figure 1, Forster discloses an axial piston pump comprising a swash plate actuating mechanism (34, 36), and a plurality of piston cylinders (21, 26) arranged radially about the

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actuating mechanism (34,36), and coupled to the actuating mechanism (34, 36). The first cylinder (21) has a working volume that differs from the working volume of the second cylinder (26).

It was old and well known in the compressor art to vary the number of piston cylinders in order to achieve the proper compression capacity. Forster shows an example of a compressor with different diameter piston cylinders. Additionally the cradle swash plate is divided into two sections and outer section (34) and an inner section (37), which are independently adjustable by transition arms (42) and (49), respectively. The adjustment of these sections control the pistons attached to the inner section (37) and those attached to the outer section (34). At the minimum compression capacity, at least one piston is attached to each section. Therefore, the inner and outer pistons are individually stroke adjustable. The Foster apparatus operates in the same manner as that recited in claim 17 and 34.

A recitation with respect to the material intended to be worked upon by the claimed apparatus does not impose any structural limitations upon the claimed apparatus, which differentiates it from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (U.S. 6,422,831 B1) and in further view of Goto et al.

Ito et al. in Figure 1 shows a compressor comprising a rotating cradle swash plate actuating mechanism (6). The cylinder barrel (9) is stationary and is pivotally attached to the housing about the cradle swash plate (6). In order to adjust the stroke of the pistons (10), the barrel is pivoted using an adjustment mechanism (15a), which comprises a bolt with a screw

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section. Even though there is no nut disclosed, it is well known within the art that fastening with a threaded bolt, and a screw and nut, is functionally equivalent in this case. Particularly, the Ito et al. device differs from the claimed invention in that there is no disclosure of a first of a plurality of cylinders having a working volume that differ from the second of the cylinders. This concept was taught by Goto et al., as outlined above. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ito et al. device, by using the cylinder arrangement of Goto et al., and associated hydraulic circuits, in order to achieve multiple stages of compression., while preserving the adjustable stroke of the Ito et al. device.

Allowable Subject Matter

10. Claims 16, 19, 20-22, and 28 are allowed.
11. Claims 2-5, and 11-14, and 25 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

12. Applicant's arguments, see paper 12, filed 6/11/2003, with respect to the rejection(s) of claim(s) 1-2, 6-8, 10, 15, and 17 under 35 U.S.C. 102(b) under Foster (U.S. 4,449,444), and 1-3, 8, and 9 under 35 U.S.C. 102(b) under Tsai (U.S. 5,049,799) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration,

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a new ground(s) of rejection is made in view of Goto et al. (US 5,931,645), and Ito et al. (U.S. 6,422,831 B1).

As such, this office action is being made non-final to afford the applicant the opportunity to respond to the new grounds of rejection.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to piston pumps.

U.S. Pat. 5,049,799 to Tsai et al.

U.S. Pat. 4,478,136 to Heiser et al.

U.S. Pat. 4,515,067 to Heyl et al.

U.S. Pat. 6,155,798 to Heiser et al.

U.S. Pat. 4,075,933 to Stephens

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Contact Information

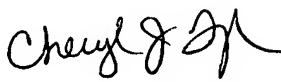
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Sayoc whose telephone number is (703) 305-0054.

The examiner can normally be reached on M-F 8 A.M. - 6 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe can be reached on (703) 308-0102. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.


Emmanuel Sayoc
Patent Examiner
Art Unit 3746


CHERYL J. TYLER
PRIMARY EXAMINER

ECS
July 21, 2003